

USSR

SHIDLOVSKIY, A. Ya.

"Some Algorithms for Operative Planning of Production Ships"

Tr. Atlantich. NII Ryb. Kh-va i Okeanogr. [Works of Atlantic Scientific Research Institute for Fishing and Oceanography], 1972, No 49, pp 14-26 (Translated from Referativnyy Zhurnal Kibernetika, No 9, 1973, Abstract No 9V599).

Translation: Two models (definition of an optimal voyage and an optimal schedule for a ship), algorithms for their solution using dynamic programming, flow charts.

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1/2 016 UNCLASSIFIED PROCESSING DATE--11DEC70
TITLE--EFFECT OF TEMPERATURE ON THE SIZE AND COMPOSITION OF DROP
ENTRAINMENT DURING MICROBUBBLING -U-
AUTHOR--(04)--GLEIM, V.G., SHIDLOVSKIY, B.R., VISHNEVETSKAYA, A.N., KHENTOV,
V.YA.
COUNTRY OF INFO--USSR
SOURCE--Zh. Prikl. Khim. (Leningrad) 1970, 43(5), 1177-8
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--HYDROLYSIS, SODIUM SILICATE, PHOSPHATE, SODIUM CHLORIDE,
THERMAL EFFECT, LIQUID DROP MODEL
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FKAME--3004/0956 STEP NO--UR/0080/15/043/005/1177/1178
CIRC ACCESSION NO--AP0131541
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--11DEC70

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CIRC ACCESSION NO--AP0131541

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. FORMATION OF 0.4 MM DIAM. BUBBLES IN BOILERS AT 200 PSI AND THEIR ENTRAINMENT WITH SUBSEQUENT CONTAMINATION OF THE STEAM WAS STUDIED BY THE TECHNIQUE OF G. (1970) IN A SO CALLED MICROBUBBLING MODEL AT 20-75DEGREES. THE TYPE AND FRACTION OF IONS CARRIED BY THE BUBBLES FROM SOLNS. CONTG. PO SUB4 PRIME3 NEGATIVE 0.5 G-L., NAOL 0.4 M, AND SIO SUB3 PRIME2NEGATIVE 0.5 G-L. (IN VARIOUS COMBINATIONS) WERE DETD. AS A FUNCTION OF TEMP. BUBBLES CONTG. THE LEAST AMT. OF IONS WERE FORMED AT 55DEGREES THE LARGE CONTENT OF SIO SUB3 PRIME2 NEGATIVE IN THE ENTRAINMENT WAS ATTRIBUTED TO THE HYDROLYSIS OF NA SILICATE AND POLYMN. (DISILICATE FORMATION). THE PRESENCE OF SIO SUB3 PRIME2 NEGATIVE IN THE SOLN. INCREASES THE DROP ENTRAINMENT. FACILITY: ROSTOV.-NA-DCNU, INST. INZH. ZHELEZNOODROZH. TRANSP., ROSTOV-GA-DCN, USSR.

UNCLASSIFIED

Acc. Nr.:

AP0029821

Ref. Code: UR 0475

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PRIMARY SOURCE: Vrachebnoye Delo, 1970, Nr 1, PP 102-105

S
ON THE THERAPEUTIC EFFICIENCY OF ELEUTHEROCOCCUS
Lyubomudrov, V.Ye.; Basamygina, L.Ya.; Bikezina, V.G.;
Mukhina, M.S.; Mikhaylova, T.I.; Osadchuk, V.S.; (Donetsk)
Shidlovskiy, Ye.F.; Bondarenko, G.A.; Demkovich, O.A.

Eleutherococcus improves abnormal pulmonary ventilation, favours normalization of the arterial pressure, positively influences cardiac rhythm and His bundle conduction. It proved rather efficient in the treatment of patients with initial stages of vibration disease. It is promising in the treatment of chronic lead intoxication. The preparation favours more rapid acclimatization of pneumoconiosis involved miners.

It is concluded that eleutherococcus may be recommended for the complex treatment of patients with some professional diseases and more rapid acclimatization of patients to sanatorium conditions.

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REEL/FRAME

19681507

AA0052662

SHIF M.I.

UR 0482

Soviet Inventions Illustrated, Section III Mechanical and General,
Derwent, 1-70

243428 PRESSURE DIFFERENCE METER FOR DIVING

APPARATUS Using a petal-type bleeding valve, air cylinder with regulator and membrane pressure transducer with sensitive element, e.g. a tensometric glued transducer, differing in the membrane transducer, attached at the level of the breathing bag, and the bleeding valve, attached at the level of the diver's lungs, are connected by a flexible tube, the inner cavity of which is connected via a regulator to the air cylinder. This gives constant registration of the pressure difference value in conditions of an actual diving descent. The membrane of the transducer, due to the pressure difference acting on it (formula for this omitted), acts on the sensitive element, which proportionally increases or decreases an electrical signal sent to a recorder on the surface along wires with a sealed lead into the pressure transducer.

2.11.67 as 1193945/40-23. VISHNIAKOV V.A. et al.
(11.9.69) Bul 16/5.5.69. Class 65b. Int.Cl.B 63c.

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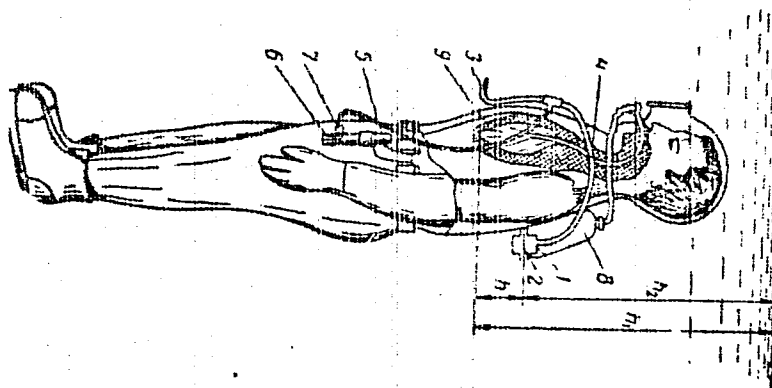
19821409

AA0052662

Vishnyakov, V. A.

Sukhikh, V. A. ;

Shif, M. I.



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19821410

USSR

UDC 621.382.322

TAMMET, KH. A., SHIFF, G.I.

"On Some Problems Of An Approximation Of The Volt-Ampere Characteristics Of Field Effect Transistors"

Tr. Tallin. politekhn. in-ta (works Of The Tallin Polytechnical Institute), 1970, A, No 291, pp 31-38 (from RZh--Elektronika i yeye primeneniye, No 12, December 1970, Abstract No 12B187)

Translation: The problem is considered of an approximation of the transfer characteristic of a field transistor by a step function and a method is presented for determining the parameters of an approximation of n and U_p for three experimentally determined points of the characteristic. An analysis is conducted of the errors of determining the parameters in question. In a saturation regime the final output impedance of the transistor is taken into account, which is approximated by a linear function. An account is given of a method for determining the output parameters of an approximation for two values of the output impedance. Computed and experimental characteristics of a field effect transistor are presented. 4 ill. 13 ref. Summary.

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USSR

UDC 621.397.62:621.317.799

GRIGOREV, V. P., SHIFF, V.P.

"Determining the Frequency Characteristic of the Low-Frequency Part of a Television Receiver Under Noise Effects"

Materialy nauchno-tekhn. konferentsii. Leningr. elektrotekhn. in-t svyazi. Vyp. 3 (Materials of the Scientific and Technical Conference. Leningrad Electrotechnical Communications Institute. Vyp. 3), Leningrad, 1970, pp 344-347 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8G174)

Translation: This article contains the results of work to determine the frequency characteristics of the electroacoustic part of television receivers class I and II under the effect of noise from the scanning unit. The measurement procedure and results of subjective statistical examination are described.

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021
UNCLASSIFIED
TITLE--DEPENDENCE OF THE PROTECTIVE EFFECT OF HYPOXIA ON THE RADIATION
PROCESSING DATE--30OCT70
DOSE RATE--U
AUTHOR--(02)--BYCHKOVSKAYA, I.B., SHIFFER, I.V.
COUNTRY OF INFO--USSR
SOURCE--RADIOBIOLOGIYA 1970, 10(1), 135-7
DATE PUBLISHED--70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--CARCINOMA, GAMMA IRRADIATION, COBALT ISOTOPE, HYPOXIA,
RADIATION PROTECTION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3001/1840
CIRC ACCESSION NO--AP0127250
STEP NO--UR/0205/70/010/001/0135/0137
UNCLASSIFIED

2/2 021

CIRC ACCESSION NO--AP0127250
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--30OCT70

ABSTRACT. THE PROTECTIVE EFFECT OF HYPOXIA (7PERCENT O) WAS STUDIED ON THE ASCITES FORM OF MOUSE EHRlich CARCINOMA, GAMMA IRRADIATED (PRIME60 CO) AT 2000 R, 12.2, OR 2.0 R-MIN. THE WT. OF THE TUMOR DEVELOPING AFTER INJECTING 2 TIMES 10 PRIME6 CELLS INTO THE MOUSE FOOT AND IRRADIATING ON THE 6TH, 8TH, AND 9TH DAY UNDER HYPOXIC CONDITIONS WAS DETD. WITH THE 12.2 R-MIN IRRADN. DOSAGE, HYPOXIA HAD A DISTINCT PROTECTIVE EFFECT, WHILE AT 2.0 R-MIN SUCH PROTECTION WAS PRACTICALLY ABSENT. FACILITY: TSENT. NAUCH.-ISSLED. RENTGENO-RADIOL. INST., LENINGRAD, USSR.

UNCLASSIFIED

USSR

UDC 681.332.65

KOKURIN, V. A., GLIKLIKH, B. P., IL'INA, G. F., and SHIFMAN, F. N.
"Synchronizer for Multicycle and Ferrite-Transistor Systems with Nonsimul-
taneous Inhibition"

USSR Author's Certificate No 273517, filed 14 Apr 69, published 18 Sep 70
(from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 6,
Jun 71, Abstract No 6B220P)

Translation: Synchronizers made of ferrotransistor elements are known in which the operating principle based on the write level's exceeding the read level is used. These synchronizers are built from special cells with augmented loop data which impose rigid requirements on the parameters of the magnetizing pulses. This complicates the master clocks significantly. Such circuits are necessary for systems with simultaneous inhibition, but their application in systems with nonsimultaneous inhibition is unjustifiable. The purpose of the proposal is to simplify the synchronizer circuit, executing it as a system based on a standard ferrotransistor with nonsimultaneous inhibition and at the same time improving the reliability of the overall device as a whole. The proposed synchronizer has been constructed, just as the known ones, from three standard memory cells with

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KOKURIN, V. A., et al., USSR Author's Certificate No 273517, filed 14 Apr 69, published 18 Sep 70 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 6, Jun 71, Abstract No 6B220P)

positive feedback and an AND-NCT circuit. In contrast to the known devices, the inputs of the AND-NOT circuit, the first and third memory cells, and the write input of the second memory cell are connected to sources of synchronizing cycle pulses, and the AND output of the AND-NOT circuit is connected to the write input of the third memory cell. The output of the first cell is connected to the read input of the second cell, the output of the second cell is connected to the second write input of the third cell, and the output of the third cell is connected to the NOT input of the AND-NOT circuit and the input of the multicycle system. The distinguishing feature of the proposed synchronizer is the principle of construction of the circuit using a read response threshold of the ferrotransistor cells with positive feedback and resistance in the emitter circuit, in which a pulse will occur at the cell output only if the read pulse energy is sufficient to overcome the response threshold and the pulse parameters at the cell output do not depend on the read pulse parameters.

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UDC 669.71.472
ANEL'KOVICH, D. I., VEDERNIKOV, G. F., DROBNIS, V. F., KLETSKO, N. L., OGURTSOV,
G. M., SHIFMAN, G. A.

"Selection and Testing of Carbon Mass for Fastening of Nipples in Roasted Anodes"

Tr. Vses. N-i. i Proyechn. In-ta. Alyumin., Magn. i Elektrodn. Prom-sti [Works
of All-Union Scientific Research and Planning Institute of the Aluminum, Magne-
sium and Electrode Industry], 1970, No. 71, pp. 111-117. (Translated from Refer-
ativnyy Zhurnal Metallurgiya, No. 5, 1971, Abstract No. 5 G156 by the authors).

Translation: Results are presented from laboratory and industrial testing of
roasted anodes with nipples fastened in their carbon masses. The mass was packed
into anodes with one square or cylindrical nipple receiver. The thickness of
the layer of packed mass was 10-15 mm. The method of fastening of the nipples
into the roasted anodes using the carbon mass allowed reliable suspension of the
anodes, significantly decreased the voltage drop at the nipple-anode contact,
and also simplified the process of pressing of anodes due to the elimination of
the screw thread in the nipple receptacle. 4 figs; 2 tables.

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USSR

BOGOMOL'NIY, YE. B., DOLGOV, A. D., ZAKHAROV, V. I., OKUN', L. B.,
SHIFMAN, M. A., SHMATIKOV, M. ZH., Institute of Theoretical and Experi-
mental Physics of the State Committee for the Use of Atomic Energy

" $K_L^0 \rightarrow \mu^+\mu^-$ and the Anomalous Interaction of Muons With Hadrons"

Moscow, Yadernaya Fizika, Vol. 16, No. 1, Jul 72, pp 129-142

Abstract: The possible contribution of the 3π -intermediate state in the imaginary part of the amplitude of $K_L^0 \rightarrow \mu^+\mu^-$ decay and the possibility of the existence of anomalous muon-pion interaction which could balance the imaginary part of the amplitude of $K_L^0 \rightarrow \mu^+\mu^-$ decay arising through the

2γ -intermediate state are discussed. It is noted that the existence of an anomalously strong pion-muon interaction could resolve the contradiction between the experimental results of Clark, Field, et al and the theory, but it is shown that the anomalous interactions $\pi^0 - 2\mu$ and $3\pi - 2\mu$ do not contradict existing experimental data on elastic and inelastic scattering of a muon by a nucleon, on the generation of muon pairs by pions, and by data on $(g - 2)$ for the muon. It is noted that in this approach series difficulties arise which are associated with the very large value of $\text{Re } K_{KL}^{(3\pi)} + 1/2$

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BOGOMOL'NIY, YE. B., et al., Yadernaya Fizika, Vol 16, No 1, Jul 72, pp 129-142

→ 2μ and with the necessity for compensating for it with a high degree of accuracy. Experimental observation of the anomalous muon-pion interaction was complicated by two circumstances: the smallness of the anomalous cross section ($\sim 10^{-34}$ cm²) and the large value of the cross sections for background processes which exceed the anomalous processes by a factor of 10-1000. Elastic backscattering of the μ -meson by a proton at an energy of ~ 1 GeV, measurement of $(g - 2)$ of the μ -meson, and a study of the $\mu p \rightarrow \mu p \pi^0$ process at $E_\mu \geq 10$ GeV are recommended as the most sensitive methods for observing this interaction. It is proposed that $\text{Im}M_{K \rightarrow 2\mu}^{(2\gamma)}$ is

compensated not by the contribution of the 3π -intermediate state but by the contribution of other intermediate states arising in $K_L^0 \rightarrow \mu^+\mu^-$ decay, such as $2\pi\gamma$. A discussion of the consequences of possible $2\pi\gamma - 2\mu$ -anomalous interaction will be the subject of a later paper.

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SHIFRIN, A. V.

Acc. Nr.: AF0042568

Ref. Code: HR 0293

JP RS 50162

Measurement of Low-Energy Electrons

(Abstract: "Measurement of Low-Energy Electrons," by Yu. I. Gal'perin, N. V. Dzhordzhio, I. D. Ivanov, I. P. Karpinskiy, E. L. Lein, E. K. Mulyarchik, B. V. Polenov, V. V. Temnyy, N. I. Fedorova, B. I. Kharanov, A. V. Shifrin and E. K. Shuyskaya; Moscow, Kosmicheskiye Issledovaniya, Vol VIII, No 1, 1970, pp 108-119)

[Note: This is part of a sectionalized article "Study of Gaseous Cor-puscles and Photoelectrons on the Satellite 'Kosmos-261'," Kosmicheskiye Issledovaniya, Vol VIII, No 1, 1970, pp 104-136]

A spectrometer for low-energy electrons, operating in the energy range 30 eV-15 keV, is described. Electrons undergo energy selection in a cylindrical capacitor and then are accelerated to 17 keV and are regis-tered by a scintillation counter with two photomultipliers operating in a coincidence circuit. The instrument field of view is circular, the aperture angle is $\sim 3.5^\circ$, the geometry factor is $2 \cdot 10^{-3} \text{ cm}^2 \cdot \text{sterad}$ and the energy resolution is $\Delta E/E = 0.18$. In the first range (30-150 eV) energy scanning is done smoothly by applying a sawtooth voltage; in the second analysis it is done smoothly at three fixed energies -- 1, 4.5 and 15 keV. The instrument can be switched from one regime to another by command from

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the earth. The paper gives the first results of measurements on the "Kosmos-261" satellite. The instruments measured the equilibrium energy spectrum of fresh photoelectrons at different latitudes for different pitch angles. Soft auroral electrons with energies from 30 eV to approximately 1 keV were registered both in the "second" zone of auroras and in the main zone of auroras in which electrons with energies 4.5 and 15 keV were also very intensive even during magnetically quiet times. On many revolutions of the satellite about the earth, passing approximately along the auroral oval, with transition from the midnight to the morning sectors there is a structureless "background" of electrons with an almost constant intensity and slowly changing angular distribution. The energy flux of these electrons is approximately 1 erg/cm²·sec. Near the midnight sector and with transition from the midnight to evening sector the fluxes of auroral electrons are far more irregular, with strong peaks, particularly at about 4.5 keV. No measurable electron intensities were discovered in the middle and low latitudes in the keV range. The upper limit of the energy flux in the quiet atmosphere is approximately $<1.5 \cdot 10^{-2}$ erg/cm²·sec. An exception is the equatorial region of the ionospheric anomaly, where as earlier (on the "Kosmos-5" satellite) there was sporadic registry of soft electrons.

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19760548

Acc. No.

AP0048368

Abstracting Service:
INTERNAT. AEROSPACE ABST.

Ref. Code:

5-70 2180293

9

A70-24315 # Study of the geoactive particles and photo-electrons by means of satellite 'Kosmos-261.' IV—Study of charged particles with a middle and high energy (Issledovanie geoaktivnykh korpuskul i fotoelektronov na sputnike 'Kosmos-261.' IV—Izmereniia zaryazhennykh chastits srednikh i vysokikh energii). A. D. Bolunova, A. D. Verevkin, Iu. I. Gal'perin, L. S. Gorn, L. S. Zhurina, I. D. Ivanov, R. N. Isaeva, I. P. Karpinski, R. A. Kovrazhkin, V. V. Temnyi, B. I. Khazanov, A. V. Shifrin, and F. K. Shvinskii. Kosmicheskie Issledovaniia, vol. 8, Jan.-Feb. 1970, p. 126-135. 7 refs. In Russian.

Descriptions of the scintillation spectrometers for measuring the electrons with energy ranging from 20 to 150 keV and more, protons with energy ranging from 0.30 to 9 MeV. A lead-screened Geiger counter for measuring the protons with energy above 50 MeV and rigid electrons is also described. The latitude-dependent intensity distribution of the intrusive electrons is determined together with the pitch distribution of the electron intensity in the auroral zone, and differential electron spectra. Z.W. 1

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19800076

A.V. SHIFRIN

Acc. Nr.: AP0042567

Ref. Code: UR0293

JPRS 55162

Measurements of Intermediate- and High-Energy Particles

(Abstract: "Measurements of Charged Particles of Intermediate and High Energies," by A. D. Bolyunova, A. D. Verevkin, Yu. I. Gal'perin, L. S. Gern, L. S. Zhurina, I. D. Ivanov, R. N. Isayeva, I. P. Karpinskiy, R. A. Kovrazhkin, V. V. Temnyy, B. I. Khaganov, A. V. Shifrin and F. K. Shuyskaya Moscow, Kosmicheskiye Issledovaniya, Vol VIII, No 1, 1970, pp 126-133)
[Note: This is part of a sectionalized article "Study of Geosactive Cor-puscles and Photoelectrons on the Satellite 'Kosmos-261'," Kosmicheskiye Issledovaniya, Vol VIII, No 1, 1970, pp 104-136]

This article describes the RIE-205 scintillation spectrometer for electrons of intermediate energies, the RIP-802 scintillation spectrometer for protons and the RIG-III lead-shielded Geiger counter. The RIE-205 instrument measured electrons in the ranges 20-45, 45-85, 85-120 and 120-150 keV and the total intensity of electrons with an energy greater than 150 keV (geometry factor $2 \cdot 10^{-3} \text{ cm}^2 \cdot \text{sterad}$). The RIP-802 instrument measured protons in the ranges 0.30-0.45, 0.45-0.70, 0.70-0.95 and 0.95-9 MeV with a geometry factor of $1.5 \cdot 10^{-2} \cdot \text{sterad}$. The RIG-III instrument measured

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protons with $E > 50$ MeV and hard electrons. In the radiation belts and auroral zones the instruments measured the fluxes and energy spectra of electrons and protons, their distribution by pitch angles and spatial-temporal characteristics. It was possible to determine the latitude variation of the intensity of injected electrons, the pitch distribution of intensity for auroral zone electrons and the differential electron spectra. For example, the electron fluxes measured with the RIE-205 spectrometer can be assigned to the following groups: a) trapped electrons in the inner zone ($L \leq 2.5$) were registered for the most part in the region near the Brazilian anomaly; their flux for an energy $E > 150$ keV attained 10^8 particles/cm²·sec, and was highly dependent on pitch angle; a pronounced maximum was observed for pitch angles 90° ; b) trapped electrons in the outer zone $2.5 \leq L \leq 7$, also with a maximum intensity for pitch angles of 90° ; in many cases quasitrapped particles were registered in the region of invariant coordinates $h_{min} \leq 100$ km with intensities up to $2 \cdot 10^6$ particles/cm²·sec·sterad; c) sporadic hard electrons injected into the atmosphere in the middle latitudes; in these cases the mean energy was usually ~ 100 keV and the particle flux attained 10^5 particles/cm²·sec; d) electrons of intermediate and high energies injected into the atmosphere in the high latitudes; they are frequently observed near the auroral zone.

19760546

USSR

UDC: 533.6.011.5

SHIFRIN, E. G., Moscow

"On the Problem of Flow of a Uniform Supersonic Jet Around a Foil"

Moscow, Izv. AN SSSR: Mekhanika Zhidkosti i Gaza, No 4, Jul/Aug 72, pp 162-165

Abstract: The author examines a uniform jet flowing around a foil with departing shock wave. The analysis is done for low supersonic oncoming flow velocities where entropy variations on the shock wave may be disregarded. The shape of the minimum flow-affected region is determined for various foil profiles. The analysis is based on the fact that there is no more than one point on the sonic line in a potential flow where the sonic line is orthogonal to the velocity vector, assuming that such a point is within the flow region, and that the sonic line is convex toward the region of supersonic velocities.

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Acc. Nr

AP0101491

Abstracting Service:

CHEMICAL ABST. 6-70

Ref. Code

UR0498

112319s Use of naphthenates in the leather industry. Strakhov, I. P.; Levenko, P. I.; Shifrin, I. G. (USSR). *Kozh.-Obuv. Prom.* 1970, 12(1), 23-6 (Russ). In the prepn. of Russian leather, the usual fatting compd., 20% tanning paste and 80% synthetic fat, was replaced by 20% tanning paste, 40% synthetic fat, 20% Al naphthenate, and 20% Zr naphthenate. In chrome-tanned shoe-upper leather, the usual filler, latex MX-30 + syntan SPS, was replaced by latex MX-30 + Al naphthenate, or syntan SPS + Al naphthenate. In all cases, improvement was obtained in wearability, stretching limit, elongation, redn. of water permeability, and wettability by water. These improvements were still further increased by irradiation of the finished leather with γ -rays from ^{60}Co at a dosage of $3-5 \times 10^5$ rads. A. S. Levesley

REEL/FRAME
19851401

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USSR

UDC: 669.141.31:539.4.013.3

TUROVSKIY, M. L., Candidate Technical Sciences, and SHIFRIN, I. M.,
Engineer

"Stress Concentration in the Surface Layer of Cemented Steel"

Moscow, Vestnik mashinostroyeniye, No. 11, 1970, pp 37-40

Abstract: This article describes tests made on specimens of cemented or casehardened steel to verify the presence of concentrated residual stresses in metallic details of complex form. The steel under test was of the 18Kh2N4VA type and the specimens were flat gears. The tests of the gears' durability were made on a hydraulic pulsator at a constant asymmetrical cycle coefficient of $r = 0.25$ on the basis of 10^7 cycles. The measurements of the residual stresses in plane specimens measuring $100 \times 20 \times 9.3$ mm were made by cleaning the surface to be tested in a 20% water solution of nitric acid with continuous automatic recording of the bending and thickness of the surface layer. Also investigated was the effect

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USSR

TUROVSKIY, M. L., et al, Vestnik mashinostroyeniye, No 11, 1970,
pp 37-40

of roughness on the stress concentration. It was found that the roughness in the longitudinal direction, unlike the roughness in the transverse direction, strongly affects the strength of the casehardened steel.

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SHIFRIN, K.S.

Shifrin 60572
19 Nov 73

(3)

STUDY OF FLUCTUATIONS OF UNDERWATER IRRADIANCE

[Article by K. S. Shifrin, V. N. Pelyavin, and A. I. Shul'gin; Leningrad, Otvet na voprosy i Amdoskopiya, Russian, Izdatel'stvo Nauka, 1972, pp 174-181]

Investigation of the structure of a natural light field on different horizons in the ocean is an important problem of the optics of the ocean. Information about the spectral, angular and polarization characteristics of the field is important both in itself and as the starting information for optical methods of sounding the ocean.

The simplest characteristic of the light field is the irradiance of the horizontal surface E . Observations have shown that the value of $E(z)$ (z = depth) experiences considerable fluctuations in time. Consequently, for a complete description of natural irradiance in the ocean it is necessary to know not only the mean values of E on different horizons but also its fluctuations.

The mean irradiance has already been the object of investigations for many years. In particular, it has been established that it decreases with depth as $\exp(-az)$. The value of a (the index of vertical attenuation) have been established for various regions of the world ocean. As for investigations of fluctuations of irradiance, data on that question are very scanty [1-5]. They all were obtained in enclosed bays and relate to small depths (2-50 meters). Measurements at great depths and in the open ocean are not known to us. In the present article a description is given of a procedure for measurements of fluctuations of underwater irradiance in open regions of the ocean to depths $z = 200-300$ meters. Also presented in it are some data obtained in measurements of fluctuations of irradiance made at four points of the Pacific Ocean at depths $z \leq 100$ meters. Those measurements were made on the fifth journey of the "Dmitriy Mendeleev" in 1971. Table 1 presents the values of parameters characterizing the experimental conditions.

1/2 . 017 UNCLASSIFIED PROCESSING DATE--02 OCT 70
TITLE--CONDITIONS OF OBSERVATION OF HALOS IN POLYDISPERSE CLOUDS -U-
AUTHOR--(02)-SHIFRIN, K.S., PUNINA, V.A.
COUNTRY OF INFO--USSR
SOURCE--AKADEMIIA NAUK SSSR, IZVESTIIA, FIZIKA ATMOS FRY I OKEANA, VOL 6
FEB. 1970, P 204-207
DATE PUBLISHED-----70
SUBJECT AREAS--ATMOSPHERIC SCIENCES
TOPIC TAGS--ATMOSPHERIC CLOUD, PARTICLE DISTRIBUTION, LIGHT SCATTERING,
ATMOSPHERIC OPTIC PHENOMENON
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1989/1904 STEP NO--UR/0362/70/006/000/0204/0207
CIRC ACCESSION NO--AP0108234
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0108234

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE RELATION BETWEEN THE FORMATION OF HALOS IN POLYDISPERSE CLOUDS AND THE DISTRIBUTION OF THE RADII OF THE SCATTERING PARTICLES. A THEORY OF HALOS IS CONSTRUCTED IN A KIRCHHOFF APPROXIMATION, AND A GRAPH SHOWING THE RELATION BETWEEN THE LOCATION OF THE HALOS AND THE WIDTH OF THE DISTRIBUTION OF THE SCATTERING PARTICLES IS PLOTTED. IT IS SHOWN THAT IT IS POSSIBLE TO ESTIMATE THE WIDTH OF THE PARTICLE DISTRIBUTION FROM THE NUMBER OF OBSERVED HALOS.

UNCLASSIFIED

1/2 036 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--MATHEMATICAL PROCESSING OF SATELLITE CLOUD PICTURES -U-
AUTHOR--(02)-SHIFRIN, K.S., FRIDMAN, YU.S.
COUNTRY OF INFO--USSR
SOURCE--METEOROLOGIYA I GIDROLOGIYA, 1970, NR 6, PP 25-34
DATE PUBLISHED-----70

SUBJECT AREAS--SPACE TECHNOLOGY, ATMOSPHERIC SCIENCES, METHODS AND
EQUIPMENT
TOPIC TAGS--SPACEBORNE ATMOSPHERIC PHOTOGRAPHY, ATMOSPHERIC CLOUD, TV
PHOTOGRAPHY

CONTROL MARKING--NO RESTRICTIONS

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UNCLASSIFIED

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MAINLY GEOMETRICAL METHODS OF INVESTIGATING TV CLOUD PICTURES REPRESENTED IN A DIGITAL FORM ARE CONSIDERED IN THE ARTICLE. ALGORITHMS OF SEARCHING FOR CONTOUR LINES, LINES OF THE BRIGHTNESS LEVEL AND THEIR MUTUAL DISPOSITION ARE OUTLINED. SOME TOTALITIES OF CLOUD FORM PARAMETER ARE PROPOSED WHICH ARE CONSIDERED AS GEOMETRICAL FIGURES OF THE ARBITRARY FORM. EXAMPLES OF STATISTICAL PROCESSING OF PICTURES AND THEIR MACHINE CLASSIFICATION ARE GIVEN.

FACILITY: GLAVNAYA GEOFIZICHESKAYA OBSERVATORIYA.

UNCLASSIFIED

1/3 042 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--INVESTIGATION OF THE FIELD OF TERRESTRIAL RADIOTHERMAL RADIATION;
STUDY OF THE FIELD OF TERRESTRIAL RADIOTHERMAL RADIATION -U-
AUTHOR--(04)-BASHARINOV, A.YE., GURVICH, A.S., TUCHKOV, L.T., SHIFRIN, K.S.

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SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY, ATMOSPHERIC SCIENCES

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PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0114656

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THIS PAPER GIVES THE RESULTS OF THEORETICAL INVESTIGATIONS OF AIRCRAFT AND SATELLITE MEASUREMENTS OF TERRESTRIAL RADIOTHERMAL RADIATION. THE FOLLOWING SUBJECTS ARE COVERED: SUPERHIGH FREQUENCY RADIATION OF THE EARTH'S SURFACE, SUPERHIGH FREQUENCY RADIATION OF THE ATMOSPHERE, GEOPHYSICAL INTERPRETATION OF THE SPECTRUM OF OUTGOING SUPERHIGH FREQUENCY RADIATION AND CHARACTERISTICS OF SUPERHIGH FREQUENCY RADIONETRIC APPARATUS. IMPORTANT RESULTS FROM MEASUREMENTS ABOARD "KOSMOS-243" ARE GIVEN. THIS SATELLITE WAS USED IN MEASURING RADIOTHERMAL RADIATION OF THE EARTH AND ITS ATMOSPHERE AT LAMBDA 1,2,3,4, EQUALS 8.5, 3.4, 1.35 AND 0.8 CM. THE SATELLITE CARRIED FOUR RADIMETERS WITH A RESPONSE OF 0.7DEGREESK AT LAMBDA SUB1, LAMBDA SUB2 AND ABOUT 2DEGREESK AT LAMBDA SUB3, LAMBDA SUB4. MEASUREMENTS AT 8.5 AND 3.4 CM WERE USED FOR THE MOST PART FOR DETERMINING THE PARAMETERS OF THE UNDERLYING SURFACE. SINCE THE WATER ICE BRIGHTNESS CONTRAST AT THESE WAVELENGTHS IS GREATER THAN 100DEGREESK, IT IS NOT DIFFICULT TO DETECT THE WATER ICE BOUNDARY AND DETERMINE ICE CONTINUITY. A FIGURE IN THE TEXT IS A MAP OF ICE FORMATIONS AROUND THE ANTARCTIC CONTINENT COMPILED FROM INTERPRETATION OF SPACE PHOTOGRAPHS. IT WAS FOUND THAT ICE CAN RELIABLY DETECTED FROM MEASUREMENTS IN THE MICRO WAVE RANGE EVEN WHEN CLOUDS ARE PRESENT. THE QUITE UNIFORM EMISSIVITY OF THE ICE FREE OCEAN MAKES IT POSSIBLE TO DETERMINE ITS SURFACE TEMPERATURE. MEASUREMENTS AT 3.5 CM ARE OPTIMUM FOR THIS PURPOSE SINCE THERE THE DEPENDENCE OF BRIGHTNESS TEMPERATURE ON WATER TEMPERATURE IS MOST CLEARLY EXPRESSED.

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SHIFRIN, R.S.

Acc. Nr.: AP0042630

Ref. Code: 71R9067
JPRS 67162

Conference on Oceanology, Atmospheric Physics, Geography

(Summary: "Session of the Department of Oceanology, Atmospheric Physics and Geography Academy of Sciences USSR in Leningrad," by N. V. Zavarina; Moscow, Izvestiya Akademii Nauk SSSR, Seriya Geograficheskaya, No 1, 1970, p 147)

A scientific session of the Department of Oceanology, Atmospheric Physics and Geography of the Academy of Sciences USSR was held in Leningrad during the period 1-2 July 1969. It was devoted to the most important meteorological problems associated with the study of other natural processes and the use of natural resources in the national economy. D. V. Nalivkin discussed the overall aspects of the study of strong winds in relation to processes in the lithosphere and hydrosphere, emphasizing that their interaction with the atmosphere is most important at the time of catastrophic phenomena. M. I. Yudin gave a review of exceptionally severe dust storms over the European part of the USSR during the last 100 years and devoted much attention to the dust storms of 1969 affecting the Ukraine. The speaker felt that his theory of turbulent diffusion of heavy particles can be applied for studying the mechanics of dust storms. Yudin feels that shelterbelts are the most effective means for protecting soils

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against wind erosion. M. I. Budyko, in a report entitled "Study of Solar Radiation and its Transformations at the Earth's Surface," generalized the research work already done in this field and told of the existing sources of information and the many spheres of its use. He devoted particular attention to the energy processes in the vegetation cover (photosynthesis process). A. F. Treshnikov reported on studies of the Arctic and hydro-meteorological servicing of the national economy in the north. The studies made during the last 15-20 years from drifting stations and by air expeditions have yielded much information on bottom relief, formation and circulation of air and water masses and the ice regime of the Arctic Ocean. The physicommechanical properties of ice of different ages have been studied and practical recommendations given on the design and power of engines for ice-breakers and other vessels. This report also examined the prospects for further Arctic research. K. Ya. Kondrat'yev told of surveys of natural resources made using artificial earth satellites. He discussed the many aspects of this problem, emphasizing the importance of global surveys, commented on advances in satellite meteorology, advanced the idea of a lunar meteorological station and the desirability and feasibility of using space-ships in geophysical research. He described the work of the AzGOSMOS Methods Laboratory at Leningrad State University. K. S. Shifrin gave a report on "Light Scattering as a Method for Studying the Structure of

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Natural Media"; it dealt with some problems in atmospheric optics of applied importance. The speaker described two methods for determining the size of scattering particles from measurements of the intensity of a scattered parallel beam in the medium: the small angles method and the spectral transparency method. It was emphasized that the theoretical data obtained by solving an integral equation correlate well with experimental data.

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Acc. Nr.:

AT0047059

Ref. Code: UR0020

JPRS 50052

(Abstract: "Determining the Structure of Atmospheric Aerosol by the Spectral Transparency Method," by N. I. Nikitinskaya, A. Ya. Perel'man and K. S. Shifrin, Leningrad Forestry Academy; Moscow, Doklady Akademii Nauk SSSR, Vol. 190, No. 2, 1970, pp. 331-333)

Determining Structure of Atmospheric Aerosol

This paper presents the results of inversion of data on the spectral transparency of the aerosol component of a layer of the moist atmosphere obtained under conditions of high transparency. Inversion was by the transparency method proposed by K. S. Shifrin, et al., DAN, 151,326, 1963. This method makes it possible to determine the size distribution of particles without any assumptions concerning the structure of the investigated disperse system. The experimental work was done near Leningrad during a 50-day period in the summer and autumn of 1951, but the only data analyzed here are for 15 days of exceptionally high transparency during prevalence of Arctic air masses. Studies of the spectral transparency were made using a Feisner thermoelectric actinometer operating jointly with a galvanometer having a response of 10^{-9} A and a set of narrow-band interference light filters. Absorption by ozone and oxygen were taken into account.

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Acc. Nr.: AT0047059

The aerosol optical thickness τ_{λ}^* was computed using the Bouguer formula. In contrast to the monotonic increase of τ_{λ}^* with a decrease in wavelength λ usually observed in a moist atmosphere, during all 15-days characterized by high transparency there was a distinct maximum of the τ_{λ}^* curve varying in the range 0.4-0.65 μ . Possible errors in the transparency method are discussed and the results obtained by this method are compared with those obtained by other authors using different methods (in particular, R. W. Fenn, Beiträge zur Physik der Atmosphäre, 37, 69, 1964). It is shown that the use of the transparency method makes it possible to obtain important information on the distribution of radii of aerosol particles by the use of simple instrumentation. The types of distribution of aerosol particles obtained under different conditions by different methods were extremely close.

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USSR

UDC: 621.397.331

SHIFRIN, L. A., Leningrad "Order of Lenin" Electrical Engineering Institute imeni V. I. Ul'yanov (Lenin)

"A Tracking Device for Image Scanning"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratztsy, Tovarnyye Znaki, No 28, 1970, Soviet Patent No 280529, Class 21, filed 12 Mar 68, p 37

Abstract: This Author's Certificate introduces a tracking device for image scanning which utilizes scanning of a small segment of the field of view. The device contains a photovoltaic cell, a video signal processing unit, a device for isolating contrast differential and two control channels, each of which contains a phase detector and an integrator. As a distinguishing feature of the patent, the dependence of the scanning parameters on the amplitude of the contrast differential is reduced by connecting a relay element in each control channel between the phase detector and the integrator, and connecting a multiplier with a filter between the integrator and the device for isolating contrast differential. Some of the filter outputs are connected to the phase detector inputs, while the others are connected to the inputs of the relay elements in each channel.

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USSR

UDC 621.397(088.8)

SHIFRIN, L. A.

"Television Set for Follow Scanning of an Image"

USSR Author's Certificate No 253124, Filed 12 Jul 68, Published 23 Jan 70
(from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9G225P)

Translation: The proposed television set for follow image scanning using the principle of circular scanning of a small segment of the field of view contains a photoelectronic converter and a scanning voltage generator the signals from which are fed to the inputs of the voltage shaping channels for the horizontal and vertical deflection of the photoelectronic converter in each of which a phase detector, a phase converter, an integrator and a summator are connected in series. In order to increase the speed during tracking of curvilinear sections, a delay line with a delay time equal to one-fourth the scanning period, a difference cascade and rectifier are included in series between the output of the photoelectronic converter and the input of the phase detectors. The second input of the difference cascade is connected directly to the output of the photoelectronic converter.

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USSR

UDC 669.71.472

ZAZOVSKIY, D. G., KAMAR'YAN, G. M., KUBASOV, V. L., SHIFRIN, L. N.

"Method of Connecting Conducting Buses"

USSR Author's Certificate No 280867, filed 8 Jun 68, published 3 Dec 70 (from RZh-Metallurgiya, No 7, Jul 1971, Abstract No 7G210F)

Translation: A method of connecting conducting buses of electrolysis baths by a low-melting alloy in the gap between the ends of the buses is proposed. In order to reduce oxidation of the alloy and improve the electrical contact between the buses, the amount of heat released from the contact connection is regulated so that during operation of the bath, the alloy is kept in the solid state, and during assembly and disassembly of the contact connection, in the liquid state. There is 1 illustration.

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USSR.

BEREZANSKIY, Yu. M., and SHIFRIN, S. N.. (Institute of Mathematics of the Ukrainian Academy of Sciences, Kiev State University)

"Generalized Symmetric Power Problem of Moments"

Kiev, Ukrainskiy Matematicheskiy Zhurnal, May-June 1971, pp 291-306.

Abstract: The following generalization of a multivariate power problem of moments is studied:

Let \mathcal{H} be the space of a kernel with an involution $\mathcal{H}^n = \underbrace{\mathcal{H} \otimes \dots \otimes \mathcal{H}}_n$ ($\mathcal{H}^0 = \mathbb{C}$),

the involution expanding in \mathcal{H}^n by means of tensor powers. The sequence $S = (S_n)_{n=0}^\infty$, where $S_n \in (\mathcal{H}^n)'$ and symmetrical, is called a "moment sequence" if

$\sum_{j,k=0}^\infty S_{j+k}(u_j \otimes \bar{u}_k) \geq 0$ for any finite sequence $u_j \in \mathcal{H}$. The expression

$S_n = \int_{\mathcal{H}^n} \underbrace{\lambda \otimes \dots \otimes \lambda}_n d\varrho(\lambda)$ ($n = 0, 1, \dots$), where $d\varrho(\lambda)$ is some nonnegative measure

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BEREZANSKIY, Yu. M., and SHIFRIN, S. N., Ukrainskiy Matematicheskii Zhurnal, May-June 1971, pp 291-306.

on the real part \mathcal{H}'_{Re} of the space \mathcal{H}' , is proven to be valid for a moment sequence satisfying some restriction on an increase in n . The restriction on the increase is such that the measure $d\varphi(\lambda)$ can be defined as single-valued as well as nonsingle-valued with respect to S . Examples are considered.

There are 23 bibliographic references.

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USSR

UDC 621.318.42:550.38

CHECHURINA, Ye. N., and SHIPILIN, V. Ya.

"Principles of Metrological Maintenance of Instrument Making in the Region of Geomagnetism"

Tr. Metrol. In-tov SSSR / Works of Metrological Institutes of the USSR /, No 120 (180), 1971, pp 24—30 (from Referativnyy Zhurnal, Metrologiya i Izmeritel'naya Tekhnika, No 32. Single Issue No 1, 1972, Abstract No 1.32.1577)

Translation : On the basis of analyses used in geomagnetic investigations of instruments, the demands for standard apparatus designated for their check up are formulated. In individual cases, the required exactness reaches the level of up-to-date technical potentialities (0.001 %). It is demonstrated that methods based on inner-atomic phenomena do not yet guarantee unity and exactness of measurements. That can be achieved by the use of an absolute measure, a standard coil substantially reproducing the unit of

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USSR

CHECHURINA, Ye. N. and SHIFRIN, V. Ya., Tr. Metrol. In-tov SSR, No 120, (180), 1971, pp 24-30

magnetic field induction by units of length and current intensity. A transmission system is suggested of the value of the magnetic field induction unit in the region of weak magnetic fields ($10^{-6} - 2 \cdot 10^{-2} \text{ T}$), the main purpose of which is to make sure of the harmony of geomagnetic measurements. A short description is presented of the individual components of the scheme. It is demonstrated that the suggested checking methods and the standard apparatus ensure the required transmission accuracy of the unit. One illustr., two tables, three biblio. refs.

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UDC 621.396.677(02)

USSR

SHIFRIN, Ya. S.

Voprosy statisticheskoy teorii antenn. (Problems of Statistical Antenna Theory), Moscow, Soviet Radio Press, 1970, 382 pp (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8B1 K)

Translation: This paper contains an investigation of the principles of statistical antenna theory. This theory investigates the antenna parameters when the current or field distribution in the antenna is random. The statistical theory has important significance in solving a broad class of problems of antenna engineering. The problems include: calculation design and evaluation of potential possibilities of large mirror and multielement antennas; analysis of an antenna with a synthesized aperture and laser antennas; estimation of the parameters of antennas operating in a turbulent medium, and so on. The results of statistical antenna theory can be used when investigating a number of problems in optics, acoustics, radio astronomy, radio wave propagation, and so on connected with diffraction in the hole with partial coherence of the sources. There are 87 illustrations, 13 tables and a bibliography with 140 entries.

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USSR

SHIFRIN, Yakov Solomonovich

"Problems of Statistical Antenna Theory" (Voprosy statisticheskoy teorii antenn),

Moscow, Sovetskoye Radio, 1970, 8,000 copies, 384 pages.

ABSTRACT: The book examines the fundamentals of statistical antenna theory. This theory investigates antenna parameters for randomly distributed current or field.

Statistical theory is highly useful in solving a wide range of problems in antenna engineering. This includes the design, construction, and analysis of the potentialities of large reflecting and multi-element antennas; analysis of antennas with synthesized apertures and laser antennas; evaluating the parameters of antennas operating in a turbulent medium; and so forth.

The results of statistical antenna theory may be useful during the research of a number of problems dealing with optics, acoustics, radio astronomy, radio wave propagation, etc., connected with aperture diffraction with partially coherent sources.

The book principally reports the results obtained by the author.

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USSR

SHIFRIN, Yakov Solomonovich, Sovetskoye Radio, 1970, 384 pages

The book is intended for scientists and engineers working in the field of antenna theory and engineering, and also for graduate and undergraduate students taking courses of related specialties. The book will also be useful to specialists of various backgrounds, who are interested in the theory of interference and diffraction of partially coherent waves and the variety of applications of this theory.

The book has 13 tables, 87 figures, and 140 citations.

The chapter headings are as follows:

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USSR

SHIFRIN, Yakov Solomonovich, Sovetskoye Radio, 1970, 384 pages.

Chapter 4. Correlated characteristics of a field	114
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SHIFRIN, Yakov Solomonovich, Sovetskoye Radio, 1970, 384 pages

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Chapter 10. Statistical theory of paraxial focusing systems	232
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Steels

USSR

UDC 669.14.018.292

NIKITIN, V. N., LITVINENKO, D. A., D'YAKONOVA, V. S., SHIFRINA, N. P., and SLAVOVA, A. I., Central Scientific Research Institute of Ferrous Metallurgy and the Cherpovets Metallurgical Plant

"Investigation of Steel 23KhG2AFR with a Minimum Yield Strength of 50 kgf/mm²"

Moscow, Stal', No 7, Jul 73, pp 647-649

Abstract: Steel 23KhG2AFR was developed on the basis of steel 16G2AF with a guaranteed yield strength of 45 kgf/mm². This steel was tested without boron (A) and with 0.0027% boron (B) and having the following chemical composition (in %):

	C	Mn	Si	Cr	V	N	S	P
A	0.20	1.40	0.43	0.66	0.086	0.011	0.029	0.024
B	0.17	1.50	0.53	0.50	0.095	0.015	0.020	0.019

In steel 23KhG2AFR the boron is bonded in the carbonitride with a crystal lattice of the type B(CN)_{0.35} or B(CN). Boron, bonding the nitrogen and carbon, evidently refines the grain boundary zones of impurities which previously

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USSR

NIKITIN, V. N., et al., Stal', No 7, Jul 73, pp 647---649

influencex the increase of ductility and impact strength of the steel. After an optimum heat treatment -- normalization at 910°C and tempering at 700°C -- steel 23KhG2AFR had the following mechanical properties in 4-mm thick sheet: yield strength -- 50 kgf/mm² (min), tensile strength -- 70 kgf/mm² (min), elongation -- 18% (min), and impact strength -- 4.0 kgf-m/cm² (min) at -40°C. Steel 23KhG2AFR is sensitive to notching under static and dynamic loads and is characterized by good engineering properties. This steel can be satisfactorily welded with the weld joint having the same strength as the base metal. Four figures, one bibliographic reference.

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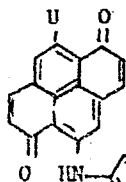
3-70

Soviet Inventions Illustrated, Section I Chemical, Derwent,

220386

DYESTUFFS suitable for dyeing "lavan" fibres in green shades are pyrene deriva

of the formula:



(where n is 1-3; R is H, COCH₃, CH₃, C₆H₅, etc). These compounds are produced by reacting 3,5,8,10-tetrachloropyrene-1,6-quinone with p-

aminophenyl ether of mono-, di- or triethylene glycol, or derivs. thereof under conditions such that one Cl atom is replaced by the corresponding amino group. In an example, 2 g of 3,5,8,10-tetrachloropyrene-1,6-quinone are mixed with 1.87 g. of p-aminophenyl ether of ethylene glycol in 20 ml. of nitrobenzene for 6 hrs. at 80°C;

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AUTHORS: Gerasimenko, Yu. Ye.; Shigalevskiy, V. A.;
Rubezhanskiy Filial Nauchno- Issledovatel'skogo
Instituta Organicheskikh Poluproduktov i Krasiteley

then cooled, filtered, washed with nitrobenzene
and then with alcohol and dried. The yield of
violet flakes of $C_{24}H_{14}Cl_2NO$ was 2.04g. (77%).
After recrystallisation from nitrobenzene, the m.p.
was 297-298°C; $\lambda_{max} = 603 m\mu$ in benzene.
23.11.66. as 1115296/23-4, GERASIMENKO, Yu. E. and
SHIGALEVSKII, V.A. Rubezhansk Sect. Organic
Intermediates and Dyestuffs Res. Inst. (4.7.69)
Bul. 20/28.6.68. Class 22b, Int. Cl. C 09b.

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UDC 621.791.72:669.71'725'721

SHIGANOV, I. N., Engineer, and KOMAROV, M. A., Candidate of Technical Sciences

"Electron-Beam Welding of an Al-Be-Mg Alloy"

Moscow, Svarochnoye Proizvodstvo, No 10, 1973, pp 11-14

Abstract: This work was devoted to development of rational procedures for electron-beam welding of parts thicker than 10 mm, and an alloy containing Al-30 Be-5 Mg, in the form of 10-mm thick sheets, 20-mm thick plates, and 250-mm diameter rings with a 12-mm wall thickness was tested. Electron-beam welding should be done with longitudinal beam oscillations with a frequency of 50 Hz and an amplitude of 2-3 mm. Also an insert of low-alloy aluminum alloys should be used and not contain a large amount of elements with a high vapor tension which prevents seam formation when vaporized. Thickness of the insert should be chosen such that the percentage participation of the base metal in seam formation does not exceed 50%. Strength of weld joints for the Al-Be-Mg alloy welded by the above method was 30 kgf/mm², which was lower than that of the base metal (40 kgf/mm²). Thus, it is necessary to pursue work in this direction in order to find means of increasing seam metal strength. 4 figures, 3 tables, 4 bibliographic references.

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USSR

UDC 621.791.72.01:669.715

KOMAROV, M. A., Candidate of Technical Sciences, and SHIGANOV, I. N., Engineer

"Features of Electron-Beam Welding of an Alloy of the Al-30Be-5Mg System"

Moscow, Svarochnoye Proizvodstvo, No 8, Aug 73, pp 22-24

Abstract: The features of electron-beam welding were studied for ABM1 alloy (Al-30Be-5Mg) with deep melting in combination with the features of the alloy structure and composition where it was found that specific weld seam defects are caused in the form of a continuous cavity. Introduction of longitudinal beam oscillations with a frequency of 50 hz and amplitude of 2-3 mm makes it possible to produce deep melting during electron-beam welding of the alloy and to remove the cavity formation. Electron-beam welding is accompanied by considerable vaporization of magnesium which leads to heterogeneity of chemical composition and hardness of metal in different sections of the weld joint. Redistribution of the beryllium constituent, depending on the thermal mode of welding, takes place in the transition zone. Four figures, one table, four bibliographic references.

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USSR

UDC 621.791.75.754.01:533.5

SHIGANOV, N. V., Doctor of Technical Sciences, POTAPOV, YU. D., Engineer,
BARESKOV, N. A., Candidate of Technical Sciences, and MAZOK, V. K., Engineer

"Some Features of Vacuum-Arc Welding With a Hollow Cathode"

Moscow, Svarochnoye Proizvodstvo, No 9, 1973, pp 17-19

Abstract: Results from a study of the main electrical characteristics of arc discharge during vacuum-arc welding with a hollow cathode and with supply of a stabilizing gas, are presented along with the specifics of the process and properties of the produced weld joints. Lanthanum-plated tungsten tubes, 4 mm in outside diameter and 2 mm inside diameter, were used as electrodes. Stainless steel 1Kh18N10T and titanium alloy VT6 were used as the two materials welded (steel-steel and titanium-titanium). It was established that the process of vacuum-arc welding with inleakage of a plasma-forming gas into the arc zone was stable over a large range of welding rates (from 2 to 100 m/hr). With a welding rate of 40 m/hr the coefficient of seam shape changes (the ratio of seam width to height is decreased). It was concluded that when welding with a hollow cathode the change in arc length of 60-70 mm does not change its voltage. A stable arch discharge can be guaranteed here with a very insignificant consumption of plasma-forming gas (0.14-2 l/hr), which makes it possible to produce stable melting upon significant fluctuations of the arc gap.

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USSR

SHIGANOV, N. V., et al., Svarochnoye Proizvodstvo, No 9, 1973, pp 17-19

Mechanical properties and welding characteristics are given for the vacuum-arc welded samples along with the same data for argon-arc welded samples for comparison. 4 figures, 1 table, 3 bibliographic references.

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USSR

UDC: 669.891.053.2

PUTILIN, Yu. M., ROMANOVA, A. D., BAZAROVA, S. I., KUCHANSKAYA, O. F.,
SHIGANOVA, G. A.

"The Interaction of Fluorite with Aluminum Oxide with Heating"

Tekhnol. Mineral'n. Syr'ya [Technology of Mineral Raw Materials -- Collection of Works], Alma-Ata, 1972, pp 135-144 (Translated from Referativnyy Zhurnal Metallurgiya, No 8, 1973, Abstract No 8G197, by G. Svodtseva).

Translation: The interaction of CaF_2 with Al_2O_3 was studied as they were heated in a vacuum (residual pressure about 0.1 mm hg) and in air in the 900-1300° temperature interval. The charge was made by a double decomposition reaction. In the 1200-1300° temperature interval, CaF_2 partially sublimates and simultaneously interacts with Al_2O_3 in an exchange reaction. The CaO liberated in this process forms Ca dialuminate with Al_2O_3 . As the temperature is increased to 1200°, the quantity of dialuminate increases to 50%. A new compound appears, $5\text{CaO} \cdot 3\text{Al}_2\text{O}_3$. As the CaF_2 is heated with Al_2O_3 in air to 900-1100°, pyrolysis of CaF_2 occurs. At 1200° and higher, sublimation and

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USSR

Putilin, Yu. M., Romanova, A. D., Bazarova, S. I., Kuchanskaya, O. F., Shiganova, G. A., Tekhnol. Mineral'n. Syr'ya, Alma-Ata, 1972, pp 135-144. (1)

an exchange reaction between CaF_2 and Al_2O_3 are observed. The AlF_3 formed is hydrolyzed by water vapor in the air. The products of the secondary interaction of CaO and Al_2O_3 are: up to 1200° -- $\text{CaO} \cdot 2\text{Al}_2\text{O}_3$, over 1200° -- $5\text{CaO} \cdot 3\text{Al}_2\text{O}_3$. 4 tables, 6 biblio. refs.

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USSR

UDC 629.7.036.54(536.246+536.9)001.2

ALEKSEYEV, V. YE., KLABUKOV, V. YA., SAGADEYEV, V. I., LUK'YANOV, YU. G.,
SHICAPOV, A. B., and KUZ'NETS, V. A.

"Indicatrix of Oxide Particle Dissipation in Products of Combustion"

Kazan', Tr. Kazan. Aviat. In-ta (Works of Kazan' Aviation Institute), No 133,
1971, pp 20-29 (from Referativnyi Zhurnal-Aviatsionnyye i Raketnyye Dvigateli,
No 2, Feb 72, Abstract No 2.34.118)

Translation: When studying the thermal radiation energy in combustion products containing solid and liquid particles of condensed aluminum, magnesium and other oxides we must know the angular distribution of dissipation radiation (dissipation indicatrix) as well as the absorption and dissipation coefficients. Presently available data on dissipation indicatrix apply basically to atmospheric physics problems. The article presents the algorithm developed by the authors for calculating the dissipation indicatrix by means of M-20, M-220 and BESM-4 computers. Indicatrix calculations with BESM-4 computers for wide range of temperatures and particle sizes of the products of combustion are also presented. 10 illustrations, 16 references.

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1/2 021
UNCLASSIFIED
TITLE--FISSION CROSS SECTIONS AND FISSION FRAGMENT DISTRIBUTION DURING THE
BOMBARDMENT OF LIGHT NUCLEI BY NEON 20 IONS -U-
AUTHOR--(04)-OBUKHOV, A.I., PERFILOV, N.A., SHIGAYEV, O.E., TKACHENKO,
YE.G.
COUNTRY OF INFO--USSR
SOURCE--YAD. FIZ. 1970, 11(5), 977-81
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--FISSION CROSS SECTION, LIGHT NUCLEUS, NEON ISOTOPE, ION
BOMBARDMENT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3008/0580
CIRC ACCESSION NO--AP0137665
STEP NO--UR/0367/70/011/005/0977/0981
UNCLASSIFIED

2/2 021

CIRC ACCESSION NO--AP0137665

UNCLASSIFIED

PROCESSING DATE--27NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE FISSION OF NUCLEI PRODUCED FROM BOMBARDMENT OF SN AND AG TARGETS BY PRIME20 NE IONS WITH ENERGIES 198, 193, AND 168 MEV WAS STUDIED. FOR THE DETECTION OF THE FISSION FRAGMENTS NARROW GLASS GLATES WERE USED. THE FRAGMENTS IMPINGING ON THE PLATES AT AN ANGLE OF 90DEGREES LEAVE TRACKS. THE FISSION CROSS SECTIONS FOR THE LIGHT NUCLEI PRODUCED AT BOMBARDMENT OF SN AND AG TARGETS BY THE PRIME20 NE IONS WITH ENERGY ABOUT 200 MEV WERE CONSIDERABLY HIGHER (BY 2-3 ORDERS OF MAGNITUDE) THAN THE FISSION CROSS SECTIONS FOR THE SAME NUCLEI AT BOMBARDMENT BY P WITH NEAR ENERGIES.

UNCLASSIFIED

USSR

SHIGIN, A. G. and KEMEL'MAKHER, G. L.

"Information-Logic System for Planning of Computer Operational Portions"

Upravlayushchiye Sistemy i Mashiny [Control Systems and Machines], 1973, No 1, pp 52-58 (Translated from Referativnyy Zhurnal Kibernetika, No 9, 1973, Abstract No 9V693).

Translation: The principles of construction and technical realization of information-logic systems of a special type, designed for use in systems for automation of the planning of digital computers are studied. The method suggested is based on generalization of the experience of preceding projects for development of objects of this class in the form of a certain plan for sequential design. Results of practical utilization of the system are described.

Authors' view

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USSR

UDC: 8.74

DZEGELENOK, I. I., DOROSHENKO, A. N., SHIGIN, A. G.

"Diagnostic Program (Problems of Predicting Myocardial Infarct by Using Digital Computers)"

Moscow, Izbr. tr. Vses. mezhvuz. simpoz. po prikl. mat. i kibernet., Gor'kiy, 1967 (Selected Works of the All-Union Intercollegiate Symposium on Applied Mathematics and Cybernetics, Gor'kiy, 1967), "Nauka", 1973, pp 254-258 (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V693 by the authors)

Translation: A recognition system of the perceptron type is considered which is based on minimizing the mean-square error arising when the characteristic function of separable classes is approximated by a system of associative elements. The effectiveness of operation with different types of associative elements in recognition of graphic patterns is verified.

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USSR

UDC 8.74

SHIGIN, G. A. .

"Planning and Designing Functional Generators which Implement Elementary Functions"

V sb. Ekon.-mat. metody i programmir. plan.-ekon. zadach (Mathematical Economic Methods and Programming Economic Planning Problems--collection of works), Moscow, 1972, pp 134-136 (from RZh-Kibernetika, No 12, Dec 72, Abstract No 12V424)

Translation: A possible means of increasing the efficiency of a digital computer is the creation of complex function generators. The efficiency of this path is still determined by the fact that at this time complex computation systems are being created for the solution of a narrow class of problems within the algorithms of which it is possible to isolate frequently used functions. A study was made of the problems of generating functions on the basis of piecewise linear transformations.

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AA0043377

UR 0482

Soviet Inventions Illustrated, Section II Electrical, Derwent,

242230 CORRECTED DIODE SWITCH. Without the input signal, the diode bridge (1) is balanced by resistor (4). Supplying positive or negative signal to the input, it will open corresponding diode (1), at the same time it will switch on corresponding correcting circuit. This is constructed by using diode (5), potentiometer (6), resistor (7). This network shunts resistor (2) and brings the balance of the bridge to its original condition.

14.2.68 as 1217991/18-24.V.V. SHIGIN (24.9.69) Bul 13/25.
4.69. Class 21a¹. Int.Cl.⁴ H 03K 03/00

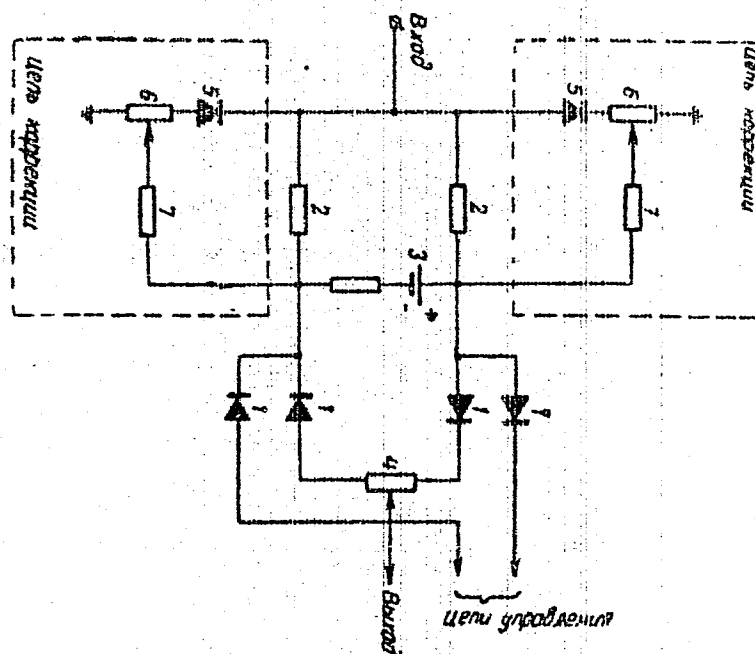
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19761644

AA0043377



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19761645

sc

USSR

UDC 621.762.001.669.541.45

3

PASHCHENKO, I. S., PETROV, G. I., KRAPUKHIN, V. V., SHIGINA, L. N.,
MINAKOV, A. T., and GALKIN, P. N.

"Study of Certain Properties of GeO_2 and Powdered Germanium"

Kremniy i germaniy [Silicon and Germanium -- collection of works], No. 2,
Moscow, Metallurgiya Press, 1970, pp. 67-70, (Translated from Referativnyy
Zhurnal-Metallurgiya, No. 1, 1971, Abstract No. 6429 by the authors).

Translation: The properties of GeO_2 produced by various methods of hydrolysis
of GeCl_4 are studied. The influence of particle size of GeO_2 and powdered
Ge on changes in bulk mass, pycnometric density, gas permeability,
specific surface, and friability is demonstrated. 4 tables; 6 biblio. refs.

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USSR

UDC: 621.762:669.018.58:669.27(088.8)

SHIGINA, V. A.

"Method of Production of Sintered Tungsten Moldings"

USSR Author's Certificate Number 349486, Filed 18/03.70, Published 6/09/72
(Translated from Referativnyy Zhurnal Metallurgiya, No 8, 1973, Abstract No 8G431), by S. Krivonosova).

Translation: A silicon-alkaline additive and Al_2O_3 are introduced to W anhydride. This is followed by reduction, pressing and two-stage sintering. In order to create a fine-grain structure and even distribution of grains through the cross section, La salt is additionally introduced to the initial W anhydride in quantities of 0.03-0.05% (as La oxide) in relationship to the W contained in the W anhydride. W moldings are used in electrical engineering and the motor vehicle industry for the manufacture of contacts for distributors and voltage regulators.

1/1

1/2 020 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--STRUCTURE AND LUMINESCENT SPECTRA OF ARYLMETHYL RADICALS -U-
AUTHOR--(03)-KOZLOV, YU.I., SHIGORIN, D.N., VOZNYAK, V.M.
COUNTRY OF INFO--USSR
SOURCE--ZH. FIZ. KHIM. 1970, 44(3), 788-90
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY, PHYSICS
TOPIC TAGS--PHOTOLYSIS, LUMINESCENCE SPECTRUM, FREE RADICAL, ELECTRON SPIN
RESONANCE, BENZENE DERIVATIVE, METHYLENE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/0722 STEP NO--UR/0076/70/044/003/0788/0790
CIRC ACCESSION NO--AP0119629
UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119629

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PHCH SUB2 PH SUB2 CH AND PH SUB3 C WERE PREPD. BY PHOTOLYSIS IN RIGID SOLNS. IN ETOH AT 77DEGREESK AND THE LUMINESCENCE OF ESR SPECTRA STUDIED; LUMINESCENCE SPECTRA WERE NOT INFLUENCED BY CONCN. OF RADICALS OF THE RIGID MATRIX. THE POSSIBILITY OF A "PROPELLER" STRUCTURE IS DISCUSSED. EXCITATION OF IRRADIATED SOLN. OF PH SUB2 CH SUB2 AT 313 M MU ALLOWED RECORDING OF LUMINESCENCE SPECTRA OF PHCH SUB2 TIMES, WHILE EXCITATION AT 334 M MU PROVIDED ONLY THE SPECTRUM OF BIPHENYL RADICAL. WAYS OF PREPG. PHCH SUB2 TIMES BY BOND RUPTURES ARE DISCUSSED. FACILITY: NAUCH.-ISSLED. FIZ.-KHIM. INST. IM. KARPOVA, MOSCOW, USSR.

UNCLASSIFIED

1/2 044
UNCLASSIFIED
TITLE--LASER EXCITATION OF THE PHOSPHORESCENCE OF ORGANIC MOLECULES -U-
AUTHOR--(02)-SHIGORIN, V.D., SHIPULO, G.P.
COUNTRY OF INFO--USSR
SOURCE--ZH. PRIKL. SPEKTROSK. 1970, 12(2), 331-3
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS, CHEMISTRY
TOPIC TAGS--LASER EXCITATION, PHOSPHORESCENCE, RUBY LASER, ANTHRAQUINONE,
AROMATIC KETONE, ORGANIC OXIDE, QUINONE, SALICYLIC ACID, PHENANTHRENE,
PHOTON, HALOGENATED ORGANIC COMPOUND
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1995/1240
CIRC ACCESSION NO--AP0116702
STEP NO--UR/0368/70/012/002/0331/0333
UNCLASSIFIED

2/2 044

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0116702

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BY USING RUBYLASER EXCITATION, THE LIFETIMES (τ) OF THE LOWEST TRIPLET STATES (T SUB1) OF 9,10,ANTHRAQUINONE (I), 1,4,NAPHTHOQUINONE (II), PHENANTHRENEQUINONE (III), PH SUB2 CO (IV), N,ETHYLACRIDONE (V), PH SUB3 N (VI), PH SUB3 CH (VII), CRYSTAL VIOLET (VIII) AND ITS LEUCO BASE (IX), DIPHENYLENE OXIDE (X), PHENANTHRENE (XI), SALICYLIC ACID (XII), AND BZOH (XIII) WERE DETD. THE τ WERE SIMILAR TO 10 PRIME NEGATIVE2-10 PRIME NEGATIVE3 SEC WITH T SUB1 OF THE N PI SEXTILE TYPE (I-IV) AND IS GREATER THAN 1 SEC WITH T SUB1 OF PI PI SEXTILE TYPE (V-XIII). WITH POLYCRYST. I, 2,CHLORO,3,BROMOANTHRAQUINONE, AND V A QUADRATIC DEPENDENCE OF THE PHOSPHORESCENCE INTENSITY ON THE LASER LIGHT INTENSITY WAS OBSD. INDICATING A 2 PHOTON EXCITATION MECHANISM.

UNCLASSIFIED

1/2 021 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--PROTECTIVE CAPACITY OF SOME PAINT AND VARNISH COATINGS IN WATER -U-
AUTHOR-(02)-SHIGORIN, V.G., YEGOROV, B.N.
COUNTRY OF INFO--USSR
SOURCE--ZAVOD. LAB. 1970, 36(3), 301-2
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--PAINT, VARNISH, PROTECTIVE COATING, FLUID PERMEABILITY, EPOXY
RESIN, POLYETHYLENE, POLYSTYRENE RESIN, MATERIAL TESTING EQUIPMENT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/1263 STEP NO--UR/0032/70/036/003/0301/0302
CIRC ACCESSION NO--AP0128679
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--20NOV70

2/2 021

CIRC ACCESSION NO--AP0128679

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE PERMEABILITY OF EPOXY COATINGS, CHLOROSULFONATED POLYETHYLENE COATINGS, AND POLYSTYRENE, ALKYD COATINGS TO HOT WATER WAS TESTED WITH A NEW TYPE OF TESTER. THE COATINGS WERE APPLIED TO THE END OF AN ELEC. CONDENSER PIPE CONSISTING OF CU AND FE PLATES SEPD. BY PAPER IMPREGNATED WITH BAKELITE. WHEN MOISTURE PENETRATED THE COATING A CURRENT STARTED TO FLOW BETWEEN CU (CATHODES) AND FE (ANODES). THE AMT. OF CURRENT INDICATED THE RELATIVE PERMEATION RATES. A SUPERIMPOSED STEADY CURRENT DROP WAS CAUSED BY THE FORMATION OF AN OXIDE FILM ON FE.

UNCLASSIFIED

USSR

UDC 621.317.33.089.6

PAVLENKO, YE. S., CHERNOV, A. M., SHIGORIN, V. P.

"Transition Standard Measures of Electrical Resistances for 10^4 to 10^9 Ohms"

Tr. metrol. in-tov SSSR (Works of the USSR Metrology Institutes), 1971, No 115 (175), pp 18-28 (from RZh-Metrologiya i Izmeritel'naya Tekhnika, No 10, Oct 71, Abstract No 10.32.1412)

Translation: A description of the R4080-R4083 transition standard and recommendations with respect to the possibility of using them to transmit the upper values of a unit of electrical resistance from standards and standard measures of 10^4 and 10^5 ohms to standards and standard measures of 10^6 - 10^8 ohms are given. There are 10 illustrations 2 tables and a 5-entry bibliography.

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Acc. Nr

AP0107153

Abstracting Service:
CHEMICAL ABST. 3-70

Ref. Code

4R0303

123010x Protective capacity of fluoroplast coatings in cor-
rosive liquid media. Shigorina, L. I.; Zvyagintseva, N. V.; Ego-
rov, B. N. (USSR). *Lakrasoch. Mater. Ikh Primen.* 1970, (1),
47-9 (Russ). The phys. properties of the F-contg. plastic, Mark
F-3M, are reported. Steel plates coated with F-3M remained in-
tact up to 3 years at 20° in 12M HNO₃, M HCl, M H₂SO₄, M
HOAc, M oxalic acid (I) M HF, 10M NaOH, 13.5M NH₄OH, and
CCl₄. Other F-contg. plastics, Mark F-3 and F-42L, were at-
tacked by HNO₃, HOAc, NH₄OH, or I. F-3M retained its protec-
tive ability at higher temps.; e.g., it decompd. in 12M HNO₃ at
90° only after 3000 hr. CPJR

REEL/FRAME

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1/2 035 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--PLASMA SURFACE STATES IN SEMICONDUCTORS -U-
AUTHOR--(02)-KONSTANTINOV, O.V., SHIK, A.YA.
COUNTRY OF INFO--USSR
SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,
NR 5, PP 1662-1674
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--SEMICONDUCTOR DEVICE, SEMICONDUCTOR MATERIAL, WORK FUNCTION,
ELECTRON, QUANTUM ELECTRODYNAMICS, SURFACE PROPERTY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3002/0004 STEP NO--UR/0056/70/058/005/1662/1674
CIRC ACCESSION NO--AP0127654

UNCLASSIFIED

2/2 035

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0127654

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EXISTENCE OF AN ELECTRON WORK FUNCTION IN SEMICONDUCTORS RESULTS IN DEPLETION OF ELECTRONS NEAR THE SEMICONDUCTOR SURFACE. THE PRESENCE OF SUCH A SURFACE QUANTUM CHARGE LEADS TO A BENDING OF THE CONDUCTIVITY BAND NEAR THE SURFACE AND TO THE EXISTENCE OF ONE OR SEVERAL SURFACE LEVELS. A MODIFICATION OF THE CLASSICAL SCREENING THEORY IS OFFERED. FACILITY:
FIZIKO-TEKHNICHESKIY INSTITUT IN. A. F. IOFFE AN SSSR.

UNCLASSIFIED

UDC: 621.315.592

USSR

SHIK, A. Ya., A. F. Ioffe Physico-Technical Institute, Leningrad

"Optical Characteristics of Superlattices of Semiconductors With Complex Zone Structure"

Leningrad, Fizika i tekhnika poluprovodnikov, No 7, 1972, pp 1268-1277

Abstract: The function of this paper is to compute the optical absorption coefficient in a superlattice made by periodically repeated semiconductor layers with various forbidden zone widths. The idea for such a structure was originally that of L. V. Keldysh, as stated in a paper published in Fizika tverdogo tela, 4, 1962, p 2265. In the present paper, the author investigates the energy spectrum and coordinate matrix elements of light electrons, which he characterizes as lighter and more mobile, with a mean free path much larger than the period of the superlattice. The results of this investigation are then applied to a computation of that part of the absorption coefficient connected with light electrons, and then to the computation of the contribution of heavy electrons. The full absorption coefficient is then the sum of these two calculations according to the weights corresponding to

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USSR

SHIK, A. Ya., Fizika i tekhnika poluprovodnikov, No 7, 1972, pp 1268-1277

the concentrations of the light and heavy electrons. To complete the problem of the superlattice optical characteristics, these concentrations are computed as the final step. The author expresses his thanks to Yu. V. Shmartsev for proposing the theme, and to O. V. Konstantinov for his valuable comments.

2/2

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1/2 014 UNCLASSIFIED PROCESSING DATE--3006170
TITLE--INTERACTION OF SYMMETRICAL EXTREMITIES DURING CONTROLLED LOCOMOTION
-U-
AUTHOR--(02)-KULAGIN, A.S., SHIK, M.L.
COUNTRY OF INFO--USSR
SOURCE--MOSCOW, BIOFIZIKA, NO 1, 1970, PP 164-170
DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, BEHAVIORAL AND SOCIAL SCIENCES
TOPIC TAGS--EXPERIMENTAL PSYCHOLOGY, EXERCISE, CAT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--1998/0823

STEP NO--UR/0217/70/000/001/0164/0170

CIRC ACCESSION NO--AP0121455

UNCLASSIFIED

2/2 014

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0121455

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONTROLLED LOCOMOTION OF MESENCEPHALIC CATS ON A TREADMILL WITH TWO BELTS WHOSE SPEED COULD BE CHANGED INDEPENDENTLY WAS STUDIED. WITH 2 AND 3 FOLD DIFFERENCES IN THE SPEED OF THE BELTS, THE SYMMETRICAL EXTREMITIES OF THE ANIMALS MOVED IN THE SAME RHYTHM (WITH EQUAL DURATION OF THE CYCLES). THE STRUCTURE OF THE STEPPING CYCLE OF THE EXTREMITIES REMAINED THE SAME AS AT THE CORRESPONDING SPEEDS ON THE "COUPLED" BELTS. WITH GREATER DIFFERENCES IN SPEED, THE INTERACTION OF THE EXTREMITIES CHANGED AND THE ANIMALS TOOK STEPS WITH THE DURATION OF THE CYCLES IN A 1:1 RATIO. THUS, THE SYMMETRICAL EXTREMITIES INTERACTED WITH BOTH SMALL AND LARGE DIFFERENCES IN THE SPEED OF THE TREADMILL BELTS. THE NATURE OF THE INTERACTION VARIED WITH THE CONDITIONS UNDER WHICH THE LOCOMOTION TOOK PLACE. THE EXPERIMENTS SHOW THAT A PARAMETER OF STEPPING MOVEMENTS SUCH AS THE STRUCTURE OF THE CYCLE DEPENDS ONLY ON ITS OWN AFFERENT IMPULSES AND INTENSITY OF STIMULATION OF THE "LOCOMOTOR REGION". ON THE OTHER HAND, PARAMETERS SUCH AS THE DURATION AND AMPLITUDE OF THE CYCLE DEPEND NOT ONLY ON THEIR OWN AFFERENT IMPULSES BUT ON THE AFFERENT IMPULSES FROM THE SYMMETRICAL EXTREMITY. FACILITY: INSTITUTE OF PROBLEMS OF INFORMATION TRANSMISSION, ACADEMY OF SCIENCES USSR.

UNCLASSIFIED

USSR

KULAGIN, A. S. and SHIK, M. L., Institute of Problems of Information Transmission, Academy of Sciences USSR

"Interaction of Symmetrical Extremities During Controlled Locomotion"

Moscow, Biofizika, No 1, 1970, pp 164-170

Abstract: Controlled locomotion of mesencephalic cats on a treadmill with two belts whose speed could be changed independently was studied. With 2- and 3-fold differences in the speed of the belts, the symmetrical extremities of the animals moved in the same rhythm (with equal duration of the cycles). The structure of the stepping cycle of the extremities remained the same as at the corresponding speeds on the "coupled" belts. With greater differences in speed, the interaction of the extremities changed and the animals took steps with the duration of the cycles in a 1:2 ratio. Thus, the symmetrical extremities interacted with both small and large differences in the speed of the treadmill belts. The nature of the interaction varied with the conditions under which the locomotion took place. The experiments show that a parameter of stepping movements such as the structure of the cycle depends only on its own afferent impulses and intensity of stimulation of the "locomotor region." On the other hand, parameters such as the duration and amplitude of the cycle depend not only on their own afferent impulses but on the afferent impulses from the symmetrical extremity.

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USSR

UDC 389.6:620.113:543.42

MATYUGINA, I. V., SPIRIDONOVA, M. P., and SHIKHALEVA, T. V.

"Standards for the Spectroscopic Determination of Hydrogen and Oxygen in Titanium Alloys"

Sverdlovsk, VII Uralsk. konf. po spektroskopii (Eighth Ural Conference on Spectroscopy) Vyp. 1, 1971, pp 79-81 (from Referativnyy Zhurnal -- Metrologiya i Izmeritel'naya Tekhnika, No 9, 1972, Abstract No 9.32.35)

Translation: It is reported that the All-Union Scientific Research Institute of Standards, during the years 1965 to 1970 put out standard sets 72, 72a and 72b for the determination of hydrogen in titanium alloy VT-14, and sets 52 and 108 for the determination of oxygen in titanium alloys type VT-6 and titanium VT-1-1. The technology of the preparation of standards with a given concentration of gases and the results of investigations of their homogeneity were reported earlier (1-4). Data concerning the establishment of the hydrogen and oxygen concentrations in the latter sets of standards and analysis of them by the spectroscopic method are reported in the present work. Certification of the hydrogen concentration of set 72-b was based on the data of seven laboratories. The methods used were vacuum-heating, spectral-isotope and spectroscopic (using set 72-a). Certification of the oxygen content of sets

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USSR

MATYUGINA, I. V., et al., VII Uralsk. konf. po spektroskopii, Vyp. 1, 1971, pp 79-81.

52 and 108 was based on the data of eight laboratories. Methods used: vacuum-fusion, isotope dilution of fast neutrons and impulse heating. Regression analysis (5) of set 72-b led to the results of the spectroscopic method with the photographic and photoelectric registration of the hydrogen lines -- H 656.3nm. The regression line was constructed with the coordinates logarithm of hydrogen concentration versus width of the hydrogen absorption line. S for the photographic method of registration, the logarithm of the hydrogen concentration was plotted versus the reading on the photoelectric instrument fototoka N, proportional to the logarithm of the hydrogen line intensity. (3 tables; 6 bibliographic entries)

2/2

Pharmacology and Toxicology

USSR

UDC 577.1:615.7/9

SHIKHALI-ZADE, Z. A.

"Effect of Certain Physiologically Active Substances on the SH-Group Content in the Blood of Irradiated Rats"

Uch. zap. Azerb. un-t. Ser. biol. n. (Scientific Notes of the Azerbaydzhan University. Biological Sciences Series), 1971, No 4, pp 83-85 (from RZh-Biologicheskaya Khimiya, No 13, Jul 72, Abstract No 13F2156)

Translation: For 30 or 40 days the rats were fed methionin (250 mg/kg), monoethanolamine (5 mg/kg), phenothiazine (100 mg/kg), naphthalane oil (I; 100 mg/kg) or its component naphthene hydrocarbons (50 mg/kg), and light aromatic hydrocarbons (15 mg/kg); then the animals were subjected to radiation (700 roentgens; the dose was 56 roentgens/min) and on the 15th, 30th, and 40th days after irradiation the SH-group content in the blood was determined. It was established that on injection of the indicated physiologically active substances, the number of SH-groups was reduced on the 15th day after irradiation, but it increased after 30 days and exceeded the amount of SH-groups in the control (irradiation only) 1.5-fold. On application of the I and its components for more than 30 days, they led to a reduction in the SH-group content in the blood. In analogous experiments, the injection of disulfone and heavy aromatic hydrocarbons caused a reduction in the number of SH-groups and death of the animals after irradiation. This indicates their toxic effects on the organism.

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USSR

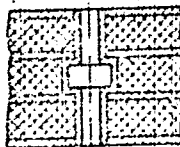
UDC 621.3.049.75

SHIKHAYEV, K. N., USTINOV, Yu. A., ZHIGALOV, A. T., ZHAK, L. I., MAKHMUDOV, M.

"A Method of Making Coupling Holes in Multilayered Printed-Circuit Boards"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 2, Jan 71, Author's Certificate No 290493, division H, filed 24 Feb 69, published 22 Dec 70, p 170

Translation: This Author's Certificate introduces a method of making coupling holes in multilayered printed-circuit boards. As a distinguishing feature of the patent, the area of contact between the conductors of inner layers of the printed circuit board and the metallizing cap is increased by making the coupling holes with a stepped shape by predrilling the holes in the insulating liners with a diameter greater than that of the holes made after the boards have been assembled and pressed.



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USSR

UDC 615.737:612.014.46

SHIKHIYEV, I. A., AKHUNDOV, E. A., MOVSUMZADE, E. M., ISAYEV, E. M., and
KLUGYL', T. A.

"The Synthesis and Psychotropic Properties of Some Acetylene Derivatives of
Phthalimide"

Baku, Azerbaydzhanskiy Meditsinskiy Zhurnal, Vol 50, No 3, Mar 73, pp 14-18

Abstract: In earlier work by the authors of this article, the synthesis of 3-phthalimido-1-propyne and of some of its amino derivatives was investigated. In the present work the neuropharmacological characteristics of the compounds of this type that had been synthesized were subjected to study in experiments on white mice. The preliminary pharmacological study indicated that some of the compounds of this class resembled with respect to their activity tranquilizers of the unsaturated carbinol type such as ethchlorovinol, oblivon, and oblivon K.

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USSR

UDC 615.787:612.014.46

KARAYEV, S. F., Candidate of Chemical Sciences, VIKHLYAYEV, YU. I., Cand
KLYGUL', T. A., Candidates of Medical Sciences, and SHIKHIYEV, I. A., Doctor
of Chemical Sciences, Chair of Petroleum Synthesis, "Institute of Petroleum and
Chemistry imeni M. Azizbekov, and Laboratory of Psychopharmacology, Moscow
Institute of Pharmacology and Chemotherapy

"Synthesis and Psychotropic Properties of 1,1,1-trichloro-4-pentyn-2-ol and
Some of its Derivatives"

Baku, Azerbayzhanskiy Meditsinskiy Zhurnal, No 5, May 71, pp 19-23

Abstract: A study was made of the neuropharmacological spectrum of action of
compounds I-V (see table). The neuropharmacological properties of the pre-
parations were determined in mice, using the following tests: subcutaneous
corazole; subcutaneous strychnine; maximum electric shock (MES); reticulum
deposit; potentiating hexenal sleep; acute toxicity. The preparations were
intraperitoneally administered to the animals in doses of 0.2 ml per 20 of
body weight. The experiments established that all of the preparations with
the exception of V have a definite effect on the central nervous system, com-
bining sedative, antispasmodic, myorelaxant, and sleep-inducing properties,
with the antispasmodic action particularly effective in spasms induced by
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KARAYEV, S. F., et al., Azerbayzhanskiy Meditsinskiy Zhurnal, No 5, May 71, pp 19-23

corazole, strychnine, and MES. All of the preparations potentiated hexenal sleep indicating the sleep-inducing and tranquilizing component in the compounds. The toxicity of the compounds varies within a range of 500 to 1,000 mg/kg of body weight.

No	Compounds
I	$\text{CCl}_3\text{CHCH}_2 \equiv \text{CH}$ OH
II	$\text{CCl}_3\text{CH} < \begin{matrix} \text{CH}_2\text{C} \equiv \text{CH} \\ \text{OCOCCH}_2\text{N}(\text{H}) \end{matrix}$
III	$\text{CCl}_3\text{CH} < \begin{matrix} \text{CH}_2\text{C} \equiv \text{CH} \\ \text{OCOCCH}_2\text{N}(\text{C}_2\text{H}_5)_2 \end{matrix}$

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IV	$\text{CCl}_3\text{CH} < \begin{matrix} \text{CH}_2\text{C} \equiv \text{CH} \\ \text{OCOCCH}_2\text{N}(\text{C}_4\text{H}_9)_2 \end{matrix}$
V	$\text{CH}_3(\text{C}_2\text{H}_5)_2\text{SiCH} = \text{CHCH}_2\text{C}(\text{CH}_3) = \text{CH}_2$ O O C CH ₃ C ₂ H ₅

1/2 011 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--SYNTHESIS AND REACTIONS OF UNSATURATED ORGANOSILICON AND
ORGANOGERMANIUM COMPOUNDS. SYNTHESIS OF DIMETHYL, P-TOLYLHYDRIDOSILANE
AUTHOR--(04)--SHIKHIYEV, I.A., GASANOVA, R.YU., ASKEROV, G.F., RZAYEVA, S.A.

COUNTRY OF INFO--USSR

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ME SUB2 SICLH (94.5 G) AND RMOSSE
FROM 24 G MG REFLUXED 2 DAYS GAVE AS SHOWN ON MICROFICHE.
FACILITY: INST. NEFTI KHIM. IM. AZIZBEKOVA, BAKU, USSR.

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ALIKhANYAN, A. I., BELYAKOV, E. S., IORIKYAN, N. P., MARKARYAN, K. Zh., and SHIKhLYAROV, K. K.

"A Study of Transition Radiation in Plastic Foam"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 17, No 9, 5 May 73, pp 453 - 456

Abstract: Recent studies have indicated the great utility of transition radiation in those high-energy regions where traditional methods of particle identification encounter great difficulties. However, there is still a lack of systematic studies of radiation spectra in porous materials. The authors used the Yerevan electron accelerator to study radiation in the frequency band 13 - 130 kev. Electrons with energies of 1 - 3.75 Gev were used to produce photons detected by a scintillation counter with a NaI crystal 2 centimeters thick and 7 centimeters in diameter, behind a beryllium salt window 100 microns thick. Differential radiation spectra and curves relating the total number of photons per electron to the characteristics of the plastic were obtained.

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UDC: None

ALIKHAN'YAN, A. I., PELYAKOV, E. S., GARIBYAN, G. M., LORIKYAN, M. P.,
MARKARYAN, K. Zh., and SHIKHLYAROV, K. K.

"Separation of Ultra-High-Energy Particles by the Radiation Transition Method"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, vol 16,
No 6, 20 September 1972, pp 315-318

Abstract: Detectors of transition radiation in the x-ray frequency range are widely used for identifying high-energy particles in cosmic rays and in large accelerators. This letter gives the results of experiments conducted on transitional radiation occurring in foam plastic of 0.04 g/cm³ density with electron energies of 1-4.5 Gev, where it was shown that the use of the streamer chamber method with a foam plastic radiator permitted the separation of particles in the energy range of $\gamma = E/mc^2 > 10^3$ with high reliability. The equipment used for the measurements was the same as that described in an earlier article (A. I. Alikhan'yan, et al, Izv. AN Arm. SSR, Fizika, 5, 1970, p 267), modified to permit observation of the primary electron track, thus easing the procedure. The question of the possibility of separating protons and pi-mesons using this method is also investigated. The authors thank A. Ts. Amatuni for his useful comments.

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100805w Addition of chlorodimethyl ether to trialkylalkenylsilanes. ~~Shukhman, A. Z.; Sultanov, R. A. (Azrb. Gos. Univ. im. Kirova, Baku, USSR). Zh. Obshch. Khim. 1970, 40(1), 77-84 (Russ).~~ Heating 41 g ClCH_2OMe with 40 g $\text{Me}_3\text{Si-CH:CH}_2$ and 2 g ZnCl_2 in an autoclave 48 hr at 150° gave $\text{MeOCH}_2\text{CH:CH}_2$, b. $46-7^\circ$, and $(\text{Me}_3\text{Si})_2\text{O}$. Similar reaction with $\text{Et}_3\text{SiCH}_2\text{CH:CH}_2$ in Et_2O 3 hr at room temp. gave $\text{MeO-}(\text{CH}_2)_2\text{CH:CH}_2$ (I), b. $70-70.5^\circ$, and $(\text{Et}_3\text{Si})_2\text{O}$; when this reaction was run with Bz_2O_3 catalyst, the same products were formed. I hydrogenated over Pd to BuOMe . Heating 64 g $\text{Me}_3\text{Si-}(\text{CH}_2)_2\text{CH:CH}_2$ with 41 g ClCH_2OMe and 2 g ZnCl_2 24 hr at 125° gave 29% $\text{Me}_3\text{Si}(\text{CH}_2)_2\text{CHCl}(\text{CH}_2)_2\text{OMe}$ (II) b. $60-1^\circ$, d^{20}_4 1.005, n^{20}_D 1.4720, which with alc. KOH 10 hr at $170-80^\circ$ gave 68% $\text{Me}_3\text{Si}(\text{CH}_2)_2\text{CH:CHCH}_2\text{OMe}$, b. $48-9^\circ$, 0.827, 1.4360. Sini-

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larly, but with Bz_2O_2 catalyst, was prepd. 22% $\text{Me}_3\text{Si}(\text{CH}_2)_2\text{CH}(\text{CH}_2\text{OMe})\text{CH}_2\text{Cl}$, b_1 67-8°, 1.013, 1.4763, which with KOH as above gave $\text{Me}_3\text{Si}(\text{CH}_2)_2\text{C}(\text{CH}_2\text{OMe})\text{CH}_2$, b_2 63-4°, 0.8327, 1.4375. II and KOAc-AcOH heated 20 hr at 200° gave 30% $\text{Me}_3\text{Si}(\text{CH}_2)_2\text{CH}(\text{OAc})(\text{CH}_2)_2\text{OMe}$, b_1 106-7°, 1.013, 1.4517; similarly was prepd. 27% $\text{Me}_3\text{Si}(\text{CH}_2)_2\text{CH}(\text{CH}_2\text{OMe})\text{CH}_2\text{OAc}$, b_1 115.5-17°, 1.020, 1.4580. These acetates kept 10 days in MeOH- H_2SO_4 gave resp. 63% $\text{Me}_3\text{Si}(\text{CH}_2)_2\text{CH}(\text{OH})(\text{CH}_2)_2\text{OMe}$, b_1 100-1°, 0.955, 1.4680; and 67% $\text{Me}_3\text{Si}(\text{CH}_2)_2\text{CH}(\text{CH}_2\text{OMe})\text{CH}_2\text{OH}$, b_1 111-12°, 0.963, 1.4700, while treating II with MeONa-MeOH gave in 20 hr 41% $\text{Me}_3\text{Si}(\text{CH}_2)_2\text{CH}(\text{OMe})(\text{CH}_2)_2\text{OMe}$, b_1 48-9°, 0.913, 1.4409; and 34% $\text{Me}_3\text{Si}(\text{CH}_2)_2\text{CH}(\text{CH}_2\text{OMe})\text{CH}_2\text{OMe}$, b_2 56-7°, 0.9255, 1.4425. NMR and ir spectra are reported.

G. M. Kosolapoff

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UDC 577.391

SHIKHODYRCOV, Y. V., ARLASHCHENKO, N. I., and GRIGOR'YEV, YU. G., Institute of Biophysics, Ministry of Health USSR, Moscow

"Morphological Changes and Disturbances in the Physiological Functions Induced in the Rabbit's Organ of Equilibrium by the Action of Ionizing Radiation"

Moscow, Radiobiologiya, Vol 11, No 4, Jul/Aug 71, pp 560-565

Abstract: Rabbits were irradiated with gamma-rays in a dose of 800 r at a dose rate of 500 r min. The most pronounced disturbances of functions of the vestibular analyzer developed within the first hours after irradiation. During this time compression of the membranous labyrinth took place as a result of disturbed lymph circulation. Because of this compression, crypts connecting the membranous with the osseous labyrinth were torn apart together with the blood vessels passing through them. Subsequently dystrophic changes took place in the inner ear, leading finally to necrosis of the sensory and secretory epithelium. Within the first hours after the action of radiation, there were pronounced changes in the labyrinth function, which were indicated by a lowering of the intensity of the nystagmus reaction in response to step stimuli and a reduced sensitivity to position changes. In later stages of the

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radiation injury, the degree to which the functions of the vestibular analyzer were impaired did not correspond to the morphological changes in the inner ear, because compensatory mechanisms of the central nervous system came into play.

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UDC 616.34-001-29.092.9-091

SHIKHODYROV, V. V., and LEBEDEV, B. I.

"Pathological Anatomy of the Enteric Form of Acute Radiation Sickness in Dogs"

Moscow, Arkhiv Patologii, Vol 33, No 11, 1971, pp 18-22

Abstract: A study was made to define the effects of acute enteric radiation sickness on systems other than the intestine, and to determine the role of such changes in the outcome of the disease. Experiments were conducted on 40 dogs, irradiated with gammaneutrons in doses from 1,000 to 5,000 REM. [Ro-entgen equivalent man]; death occurred within 7-9 days. The pathological and anatomical nature of the disease was destruction of hemodynamics, dystrophy, and tissue destruction; the critical organ was the small intestine. Necrotic changes were pronounced in other internal organs; cell destruction was observed in hemopoietic organs. Morphological changes in the internal organs (spleen, liver, kidneys, lungs) in the lymph, thyroid, pituitary, and adrenal glands, in bone marrow; and in the circulatory, nervous, and gastrointestinal systems are described. Changes in the hemopoietic organs and testicles are direct consequences of radiation; in others, cell destruction is possibly the result of acute impairment of blood supply. However, the conclusion is that, with the exception of the small intestine, such changes

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SHIKHODYROV, V. V., and LEBEDEV, B. I., Arkhiv Patologii, Vol 33, No 11, 1971, pp 18-22

were not severe enough to cause death. In cases of early death (2-3 days following irradiation), when the mucosa had not yet been destroyed, but a circulatory impairment was present, there was indication of a neuroreflex mechanism: traumatic shock. This consisted of general impairment of capillary and venous circulation in organs with development of stasis and edema, impaired hemodynamics in the lungs and liver, and changes in the anterior lobe of the pituitary gland with degranulation and decrease in basophilic cells. Secondary shock is known to be related to intoxication of the nervous system, possibly, in this case, by histamine and histamine-like substances. The results may be peculiar to dogs, as they are especially sensitive to these agents and have more of them in their gastric and intestinal mucosa than other experimental animals.

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